

THEORETICAL AND APPLIED GENETICS

Vol. 57 1980

International Journal
of Breeding Research and Cell Genetics

Editorial Board

Managing Editor: H. F. Linskens, Nijmegen

H. Abplanalp, Davis	G. Melchers, Tübingen
L. Alföldi, Szeged	B. R. Murty, New Delhi
R. W. Allard, Davis	O. E. Nelson, Madison
J. S. F. Barker, Armidale	P. L. Pfahler, Gainsville
D. K. Belyaev, Novosibirsk	R. Riley, F. R. S., London
Y. Y. Gleba, Kiev	A. Robertson, F. R. S., Edinburgh
Å. Gustafsson, Lund	H. Skjervold, Vollebekk
R. Hagemann, Halle/S.	P. Spiegel-Roy, Bet Dagan
Hu Han, Peking	H. Stubbe, Gatersleben
R. C. Lewontin, Cambridge, Mass.	K. Tsunewaki, Kyoto
W. J. Libby, Berkeley	L. D. Van Vleck, Ithaca
J. Mac Key, Uppsala	G. Wenzel, Köln
P. Maliga, Szeged	D. von Wettstein, Copenhagen
F. Mechelke, Stuttgart	



Springer International

Founded in 1929 under the title 'Der Züchter' as a German journal for theoretical and applied genetics and edited until 1945 by Erwin Bauer; changed from a national journal devoted almost exclusively to plant breeding to an international periodical for genetics and breeding research under the same title 'Der Züchter' in 1966; in 1968 to 'Theoretical and Applied Genetics'; edited by H. Stubbe from 1946 to 1976.

The exclusive copyright for all languages and countries, including the right for photomechanical and any other reproduction, also in micro-form, is transferred to the publisher.

The use of registered names, trademark, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

Springer-Verlag Berlin • Heidelberg • New York

Printed in Germany. — © by Springer-Verlag KG Berlin • Heidelberg 1980

Beltz Offsetdruck, Hemsbach

Table of Contents

Originals

Ahokas, H.: Cytoplasmic Male Sterility in Barley. Part 7: Nuclear Genes for Restoration 193

Allaire, F.R.: Mate Selection by Selection Index Theory 267

Ayyagari, V.; Mohapatra, S.C.; Venkatramaiyah, A.; Thiagasundaram, T.; Choudhuri, D.; Johri, D.C.; Ranganathan, P.: Selection for Egg Production on Part Records. Part 1: Evaluation of Short Term Response to Selection 277

Bachmann, K.: see Nagl, W., 107

Beiles, A.: see Horovitz, A., 11

Berry, S.F.: see Power, J.B. et al., 1

Bhatia, C.R.: see Pawar, S.E., 171

Blaas, J.: see Bredemeijer, G.M.M., 119

Bohnert, H.J.: see Gordon, K.H.J. et al., 203

Bredemeijer, G.M.M.; Blaas, J.: Do S Allele-specific Peroxidase Isoenzymes Exist in Self-incompatible *Nicotiana alata*? 119

Brown, A.H.D.: see Moran, G.F., 101

Caton, M.P.: see Lewis, E.J. et al., 237

Chang, W.C.; Hsing, Y.L.: Plant Regeneration Through Somatic Embryogenesis in Root-derived Callus of Ginseng (*Panax ginseng* C.A. Meyer) 133

Chapman, J.V.: see Power, J.B. et al., 1

Choudhuri, D.: see Ayyagari, V. et al., 277

Cocking, E.C.: see Power, J.B. et al., 1

De Buyser, J.; Henry, Y.: Induction of Haploid and Diploid Plants Through in Vitro Anther Culture of Haploid Wheat ($n = 3x = 21$) 57

Dellaert, L.M.W.: Segregation Frequencies of Radiation-induced Viable Mutants in *Arabidopsis thaliana* (L.) Heynh. 137

den Nijs, T.P.M.: see Johnston, S.A. et al., 5

Diez, N.: see Jouve, N. et al., 75

Dobrofsky, S.; Grant, W.F.: An Investigation into the Mechanism for Reduced Seed Yield in *Lotus corniculatus* 157

Duncalfe, F.: see McPhee, C.P. et al., 49

Dwivedi, S.L.; Rai, K.N.; Singh, R.B.: Diallel Analysis of Heading Date in Rice (*Oryza sativa* L.) 43

Eisen, E.J.: Influence of Early Pregnancy on Reproductive Rate in Lines of Mice Selected for Litter Size 209

Fitz-Earle, M.: see Holm, D.G. et al., 247

Gallais, A.; Wright, A.J.: A General Approach to the Concept of Varietal Ability for Synthetic Varieties 81

Gordon, K.H.J.; Hildebrandt, J.W.; Bohnert, H.J.; Herrmann, R.G.; Schmitt, J.M.: Analysis of the Plastid DNA in an *Oenothera* Plastome Mutant Deficient in Ribulose Bisphosphate Carboxylase 203

Grant, W.F.: see Dobrofsky, S., 157

Gregorius, H.: The Effect of Positive Assortative Mating at One Locus on a Second Linked Locus. Part 2: Limiting Characteristics of Gametic and Genotypic Structures 17

Hanneman, R.E.Jr.: see Johnston, S.A. et al., 5

Hayward, C.F.: see Jošt, M., 177

Henry, Y.: see De Buyser, J., 57

Hernandez, P.: See Schwartzman, J.B., 221

Herrmann, R.G.: see Gordon, K.H.J. et al., 203

Hesemann, C.U.: Cytophotometrical Measurement of Nuclear DNA Content in Some Coniferous and Deciduous Trees 187

Hildebrandt, J.W.: see Gordon, K.H.J. et al., 203

Holm, D.G.; Fitz-Earle, M.; Sharp, C.B.: Chromosome Replacement in Mixed Populations of Compound-2L; Free-2R and Standard Strains of *Drosophila melanogaster*. An Example of Unstable Genetic Isolation 247

Horovitz, A.; Beiles, A.: Gynodioecy as a Possible Populational Strategy for Increasing Reproductive Output 11

Hsing, Y.I.: see Chang, W.C., 133

Humphreys, M.W.: see Lewis, E.J. et al., 237

Izhar, S.; Tabib, Y.: Somatic Hybridization in *Petunia*. Part 2: Heteroplasmic State in Somatic Hybrids Followed by Cytoplasmic Segregation into Male Sterile and Male Fertile Lines 241

Jelenkovic, G.: see Paris, H.S. et al., 145

Johnston, S.A.; den Nijs, T.P.M.; Peloquin, S.J.; Hanneman, R.E. Jr.: The Significance of Genic Balance to Endosperm Development in Interspecific Crosses 5

Johri, D.C.: see Ayyagari, V. et al., 277

Jošt, M.; Hayward, C.F.: F_1 Hybrid Versus 32 Selected F_2 Lines Performance of Common Winter Wheat (*Triticum aestivum* ssp. *vulgare*) 177

Jouve, N.; Diez, N.; Rodriguez, M.: C-Banding in $6x$ -*Triticale* \times *Secale cereale* L. Hybrid Cytogenetics 75

Kao, K.N.: see Wetter, L.R., 273

Katagi, H.: see Senda, M. et al., 33

Kemble, R.J.: A Rapid, Single Leaf Assay for Detecting the Presence of 'S'-Male-sterile Cytoplasm in Maize 97

Kupzow, A.J.: Theoretical Basis of the Plant Domestication 65

Lewis, E.J.; Humphreys, M.W.; Caton, M.P.: Chromosome Location of Two Isozyme Loci in *Lolium perenne* Using Primary Trisomics 237

Lokki, J.: see Suomalainen, E. et al., 129

McPhee, C.P.; Trappett, P.C.; Neill, A.R.; Duncalfe, F.: Changes in Growth, Appetite, Food Conversion Efficiency and Body Composition in Mice Selected for High Post-weaning Weight Gain on Restricted Feeding 49

Mok, D.W.S.: see Rabakoarihanta, A. et al., 59

Mok, M.C.: see Rabakoarihanta, A. et al., 59

Mohapatra, S.C.: see Ayyagari, V. et al., 277

Moran, G.F.; Brown, A.H.D.: Temporal Heterogeneity of Outcrossing Rates in Alpine Ash (*Eucalyptus delegatensis* R.T. Bak.) 101

Morikawa, H.: see Senda, M. et al., 33

Nagl, W.; Bachmann, K.: Condensed Chromatin in Diploid and Allopolyploid *Microseris* Species with Different Genome Size: a Quantitative Electron Microscopic Study 107

Neill, A.R.: see McPhee, C.P. et al., 49

Nicholas, F.W.: see Yoo, B.H. et al., 113

Orton, T.J.; Steidl, R.P.: Cytogenetic Analysis of Plants Regenerated from Colchicine-treated Callus Cultures of an Interspecific *Hordeum* Hybrid 89

Paris, H.S.; Shiffris, O.; Jelenkovic, G.: Nucleolar Organizing Chromosomes of *Ricinus* 145

Parsons, P.A.: Adaptive Strategies in Natural Populations of *Drosophila*. Ethanol Tolerance, Desiccation Resistance, and

Development Times in Climatically Optimal and Extreme Environments 257

Pawar, S.E.; Bhatia, C.R. The Basis for Grain Yield Differences in Mungbean Cultivars and Identifications of Yield Limiting Factors 171

Peloquin, S.J.: see Johnston, S.A. et al., 5

Power, J.B.; Berry, S.F.; Chapman, J.V.; Cocking, E.C.: Somatic Hybridization of Sexually Incompatible Petunias: *Petunia parodii*, *Petunia parviflora* 1

Rabakoarhanta, A.; Shii, C.T.; Mok, M.C.; Mok, D.W.S.: Meiosis and Fertility of Interspecific Hybrids Between *Phaseolus vulgaris* L. and *P.acutifolius* A. Gray 59

Rai, K.N.: see Dwivedi, S.L. et al., 43

Rathie, K.A.: see Yoo, B.H. et al., 113

Reddy, G.M.: see Vaidyanath, K. et al., 181

Renganathan, P.: see Ayyagari, V. et al., 277

Rick, C.M.: see Tanksley, S.D., 161

Rodriguez, M.: see Jouve, N. et al., 75

Rovida, E.: see Sari Gorla, M., 37

Sari Gorla, M.; Rovida, E.: Competitive Ability of Maize Pollen. Intergametophytic Effects 37

Saura, A.: see Suomalainen, E. et al., 129

Savidan, Y.: Chromosomal and Embryological Analysis in Sexual x Apomictic Hybrids of *Panicum maximum* Jacq. 153

Schmitt, J.M.: see Gordon, K.H.J. et al., 203

Schwartzman, J.B.; Hernandez, P.: Sister Chromatid Exchanges and Chromosomal Aberrations in 5-Aminouracil-synchronized Cells 221

Sendra, M.; Morikawa, H.; Katagi, H.; Takada, T.; Yamada, Y.: Effect of Temperature on Membrane Fluidity and Protoplast Fusion 33

Sharp, C.B.: see Holm, D.G. et al., 247

Shiffriss, O.: see Paris, H.S. et al., 145

Shii, C.T.: see Rabakoarhanta, A. et al., 59

Singh, D.P.: Inheritance of Resistance to Yellow Mosaic Virus in Blackgram (*Vigna mungo* (L.) Hepper) 233

Singh, R.B.: see Dwivedi, S.L. et al., 43

Steidl, R.P.: see Orton, T.J., 89

Suomalainen, E.; Saura, A.; Lokki, J.; Teeri, T.: Genetic Polymorphism and Evolution in Parthenogenetic Animals. Part 9: Absence of Variation Within Parthenogenetic Aphid Clones 129

Tabib, Y.: see Izhar, S., 241

Takada, T.: see Senda, M. et al., 33

Tanksley, S.D.; Rick, C.M.: Isozymic Gene Linkage Map of the Tomato: Applications in Genetics and Breeding 161

Teeri, T.: see Suomalainen, E. et al., 129

Thiagasundaram, T.: see Ayyagari, V. et al., 277

Tomiuk, J.; Wöhrmann, K.: Enzyme Variability in Populations of Aphids 125

Trappett, P.C.: see McPhee, C.P. et al., 49

Vaidyanath, K.; Reddy, G.M.: Aminoacid Profiles in the Study of Phylogenetic Relationships in the Genus *Oryza* 181

Venkatramaiyah, A.: see Ayyagari, V. et al., 277

Wetter, L.R.; Kao, K.N.: Chromosome and Isoenzyme Studies on Cells Derived from Protoplast Fusion of *Nicotiana glauca* with *Glycine max-Nicotiana glauca* Cell Hybrids 273

Wöhrmann, K.: see Tomiuk, J., 125

Wolff, G.: Investigations on the Relations Within the Family Papilionaceae on the Basis of Electrophoretic Banding Patterns 225

Wright, A.J.: see Gallais, A., 81

Yamada, Y.: see Senda, M. et al., 33

Yoo, B.H.: Long-term Selection for a Quantitative Character in Large Replicate Populations of *Drosophila melanogaster* Part 3: The Nature of Residual Genetic Variability 25

Yoo, B.H.; Nicholas, F.W.; Rathie, K.A.: Long-term Selection for a Quantitative Character in Large Replicate Populations of *Drosophila melanogaster*. Part 4: Relaxed and Reverse Selection 113

Book Reviews

16, 42, 48, 64, 80, 88, 96, 106, 112, 118, 124, 128, 144, 176, 208, 236, 240, 246, 256, 284

Announcement

192

Acknowledgement

The editors thank the following external referees for their assistance

E.L. Breese (Aberystwyth)

W. Hennig (Nijmegen)

R.M. Rauter (Toronto)

M. Carlson (Davis, Calif.)

J. Hood (Berkeley)

E.E. Riemschneider (Rhinlander)

C. Cockerham (Raleigh)

E. Hutchinson (Davis, Calif.)

D.V. Shaw (Davis, Calif.)

L. Fins (Berkeley)

J.W. James (Armidale)

J. Sved (Canberra)

P. Foley (Davis, Calif.)

A.L. Kahler (Brookings, South Dakota)

J. Sybenga (Wageningen)

D.P. Fowler (Fredericton)

M. Morris (Davis, Calif.)

G. Thomson (Berkeley, Calif.)
P.M.A. Tigerstedt (Helsinki)

Shu Geng (Davis, Calif.)

N. Nienstedt (Rhinlander)

B. Weir (Raleigh)

as well as the assistance of Mrs. Ann Jenks-Coupland (Nijmegen) and Mrs. Mary M. Chilcott (London).